

REMARKS

Favorable reconsideration of this application, as amended, is respectfully requested.

Replacement sheets of drawings for Figs. 23(a), 23(b), 24, 25, and 26 are submitted herewith designating these figures as "background art". These figures relate to the development of the present invention and are not admitted prior art.

Independent Claims 33 and 40 have been amended to clarify the manner in which Applicants' invention distinguishes patentably from the prior art. The amendment of Claim 40 overcomes the objection to that claim. Claims 35 and 41 have been amended for consistency with base Claims 33 and 40, respectively.

Independent Claims 33 and 40 were rejected under 35 U.S.C. § 102(b) as being anticipated by Hamm (US 6,294,018).

Claim 33 recites, inter alia, (b) forming an emitter electrode of the hetero-junction bipolar transistor over the third semiconductor layer; (c) after the step (b), forming the third semiconductor layer into a mesa-shaped emitter layer of the hetero-junction bipolar transistor; and (d) after the step (c), forming a base electrode over the second semiconductor layer outside the mesa-shaped emitter layer.

Claim 33 further recites, (e) after the step (d), forming a photo resist film over the emitter and base electrodes; and (f) after the step (e), etching the second semiconductor layer to form a mesa-shaped base layer of the hetero-junction bipolar transistor, wherein in the step (e),

an outer periphery of the base electrode is exposed from the photo resist film; and in the step (f), the photo resist film and base electrode act as an etching mask.

Referring to Applicants' specification and drawings, by way of example and without limiting the claim, in the present invention a base electrode 10 is used as an etching mask when a p-type GaAs layer 7 is etched to form a mesa-shaped base layer 7a. To use the base electrode 10 as an etching mask, a photo resist film 26 is formed such that an outer periphery of the base electrode 10 is exposed (see Fig. 5 and the paragraph on page 30 of the specification beginning at line 4).

In Hamm, the whole part of a base contact 55 (base electrode) is covered by an etch mask 61 when a base layer 45 is etched. It is apparent that the base contact cannot act as an etching mask. Accordingly, Claim 33 distinguishes patentably from Hamm.

The claims dependent upon Claim 33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hamm and Prasad (US 5,268,315). However, the Prasad reference does not cure the deficiencies of Hamm. Dependent Claims 34, 35, and 37-39 should be allowed along with base Claim 33.

Independent Claim 40 recites, inter alia, (e) forming an emitter electrode of the hetero-junction bipolar transistor over the third semiconductor layer; (f) after the step (e), forming the third semiconductor layer into a mesa-shaped emitter layer of the hetero-junction bipolar transistor; and (g) after the step (f), forming a base

electrode of the second semiconductor layer outside the mesa-shaped emitter layer.

Claim 40 further recites, (h) after the step (g), forming a photo resist film over the emitter and base electrode; and (i) after the step (h), etching the second semiconductor layer to form a mesa-shaped base layer of the hetero-junction bipolar transistor, wherein in the step (h), an outer periphery of the base electrode is exposed from the photo resist film; and in the step (i), the photo resist film and base electrode act as an etching mask.

It is apparent from the discussion of Claim 33 vis-a-vis Hamm that Claim 40 distinguishes patentably from Hamm and should be allowed. Dependent Claim 41 rejected under 35 U.S.C. § 103(a) as being unpatentable over Hamm and Prasad is also allowable, because, as noted earlier, Prasad does not cure the deficiencies of Hamm.

Although Chau was not relied upon in the rejection of the claims addressed above, it should be noted that in Chau the whole part of a base contact 624 (base electrode) is covered with silicon nitride 628 when a base layer 610 is etched (see Fig. 6C and column 5, lines 27-36). It is apparent that the base contact 624 cannot act as an etching mask.

This application is now clearly in condition for allowance.

The Commissioner is hereby authorized to charge to Deposit Account No. 50-1165 any fees under 37 C.F.R. §§ 1.16 and 1.17 that may be required by this paper and to credit

any overpayment to that Account. If any extension of time is required in connection with the filing of this paper and has not been requested separately, such extension is hereby requested.

Respectfully submitted,

NHS:lmb

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AMENDMENTS TO THE DRAWINGS:

Please substitute the attached replacement sheets for Figures 23-26 of the drawings.